

What Is Claimed Is:

1. A method for detecting acid stratification in a battery including the following steps:
  - determining a first state of charge value ( $SOC_1$ ) during a load period of the battery on the basis of an estimated open-circuit voltage,
  - determining a second state of charge value ( $SOC_2$ ) during a rest period of the battery following the load period on the basis of a measured open-circuit voltage,
  - comparing the first state of charge value ( $SOC_1$ ) to the second state of charge value ( $SOC_2$ ), and
  - detecting acid stratification when a defined deviation ( $\Delta SOC$ ) of the first state of charge value ( $SOC_1$ ) from the second state of charge value ( $SOC_2$ ) is exceeded.
2. The method as recited in Claim 1,  
wherein the deviation ( $\Delta SOC$ ) is defined as >20%.
3. The method as recited in Claim 1,  
wherein the estimated open-circuit voltage is determined via an observation device, a Kalman filter in particular, the Kalman filter estimating the open-circuit voltage on the basis of a measured battery voltage and/or a measured battery temperature and/or a measured battery current using a model describing the battery.
4. A method for determining the state of charge of a battery during a rest period including the following steps:
  - detecting acid stratification according to a method as recited in one of Claims 1 through 3,
  - assuming the first state of charge value ( $SOC_1$ ) for the rest period when the defined deviation ( $\Delta SOC$ ) of the first state of charge value ( $SOC_1$ ) from the second state of charge value ( $SOC_2$ ) is exceeded.
5. A method for neutralizing acid stratification in a battery including the following steps:

- detecting acid stratification according to a method as recited in one of Claims 1 through 3,
  - increasing a charging voltage for charging the battery when the defined deviation ( $\Delta SOC$ ) of the first state of charge value ( $SOC_1$ ) from the second state of charge value ( $SOC_2$ ) is exceeded.
6. Use of a method as recited in one of Claims 1 through 4 in a system for detecting the performance capacity of the battery.
  7. Use of a method as recited in one of Claims 1 through 5 in an electrical battery management system.